Danfoss

ADAP-KOOL

AK2-SC255

E version

Supplement Manual
Software Release VE2.020
E Version

ELECTRONIC CONTROLS
& SENSORS

Supplement Manual

Contents

Preface

This supplement manual is designed to compliment the already existing **AK2-SC255 System Reference Manual (RS.8D.M1.22)** and highlights the 'E' version of AK2-SC255 software.

In addition further information can be found via;
AK2 Input - Output Modules (RS.8C.H5.22)
AK2-SC 255 On site Guide (RS.8C.J2.22)
Data Communication between ADAP-KOOL® Refrigeration Controls (RC8AC302)
AK2-Sc255 Fact sheet (DKRCE.ED.R1.A1.22 / 520H1486)

The 'E' version of the Ak2-SC255 software allows for direct support of EKC and AK2 Danfoss controls and is commonly referred to as 'de-centralized control'. Due to this discrete yet fundamental difference in 'E' and 'Rack' versions many new user screens and functions have been developed that are not described in the 'Rack' manual.
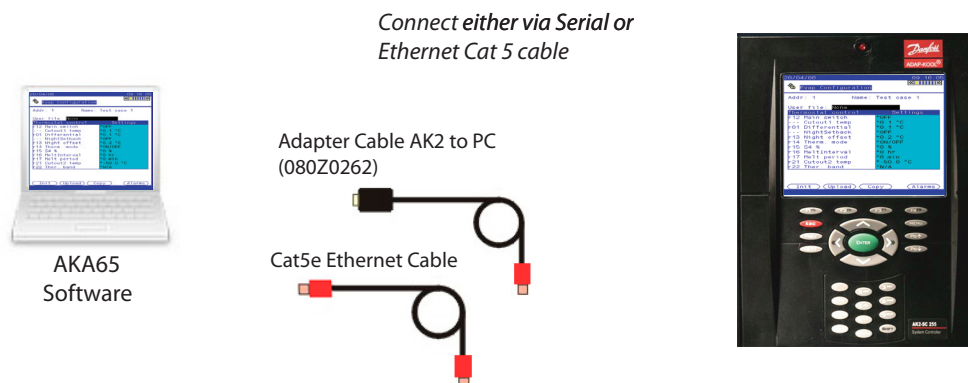
To get the best benefit from this supplement manual please ensure you have a good knowledge of the various system menus and features as described in the AK2-SC255 system reference manual - although the system manual refers to the 'Rack' version of the AK2-SC255 many of the screens and setup guides are relevant.

Due to the highly flexible nature of the AK2-SC255 product and the multiple configurations it can cover, it is highly recommended that prior to any major commissioning you attend an authorized Danfoss training course to get the most out of your system.
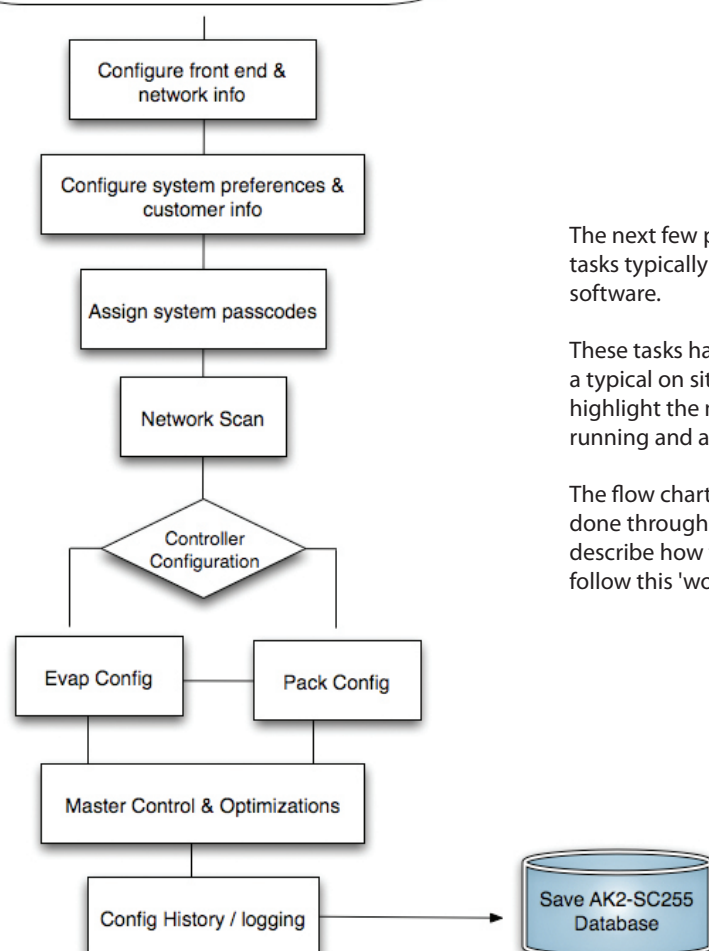
Getting Started

The following instructions represent the typical steps needed to get the AK2-SC255 up and running, although not exhaustive this represents the most widely used settings in most typical customer applications.

To assist in the commissioning process not only can the local key pad be used for all tasks, so can the system support software tool - **AKA65**. Utilizing the AKA65 software will allow 'on-line' and 'off line' commissioning. Connection to the AK2-SC255 can be made either via serial RS232 or Ethernet.

Connect either via Serial or Ethernet Cat 5 cable

AKA65
Software

Adapter Cable AK2 to PC
(080Z0262)

Cat5e Ethernet Cable

Note that if a straight PC to AK2-SC255 connection is made via Ethernet cable it must be a cross over type. If connecting via an Ethernet hub or switch a regular Cat 5 cable can be used

Typical 'new build' Commissioning

Configure front end & network info

Configure system preferences & customer info

Assign system passcodes

Network Scan

Controller Configuration

Evap Config

Pack Config

Master Control & Optimizations

Config History / logging

Save AK2-SC255 Database

The next few pages of the manual describe common commissioning tasks typically through the Ak2-SC255 front end or via the AKA 65 support software.

These tasks have been broken down into simple steps that replicate a typical on site commissioning. Although not exhaustive, the steps highlight the main aspects of getting the AK2-SC255 front end up and running and able to communicate with a range of networked controllers.

The flow chart opposite represents the typical functions and operations done throughout the commissioning process. The following pages describe how to execute the various commissioning functions and will follow this 'work flow'

Initial AK2-SC255 settings and Customer Information
Once powered up the AK2-SC255 will need to have the time and date set, along with other customer and preference related information. At this early stage ensure that the system backup battery (CR2032) is correctly placed thus ensuring that any settings / database modifications are saved and that the rotary host address switch is set to 0 (master)
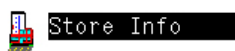
Store Info

From the main menu select 'Store Info'. From there configure;

                                    Store Name
                                    Time and Date
                                    Store Opening Hours
                                    Holidays
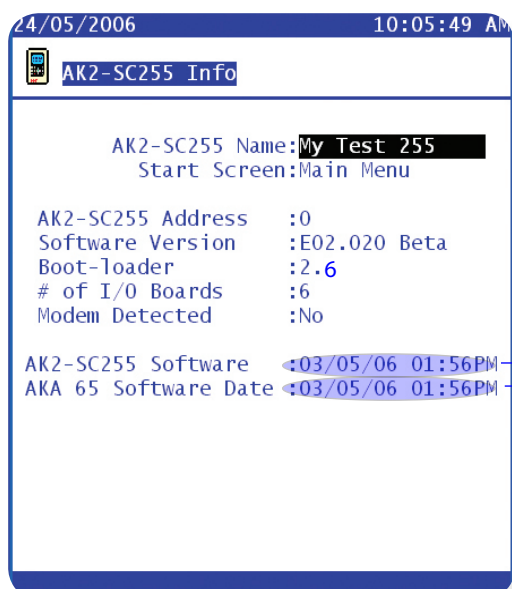   Daylight Savings
                                    Leak Detector (Monitor Only)
                                    Contact Info (Information Only)
                                    Manager Override

```
04/19/06          Alarm!        07:59:39 PM

   Main Menu          F1 = Help

     Refrigeration        Authorization

     Alarms               Store Info

     Energy               AK2-SC255 Info

     Miscellaneous        Communications

     History              Configuration
```

Info Screen   AK2-SC255 Info

To review the version of AK2-SC255 software select the AK2-SC255 Info screen via the 'Main Menu'

```
24/05/2006              10:05:49 AM

   AK2-SC255 Info


        AK2-SC255 Name:My Test 255
         Start Screen:Main Menu

   AK2-SC255 Address   :0
   Software Version    :E02.020 Beta
   Boot-loader         :2.6
   # of I/O Boards     :6
   Modem Detected      :No

   AK2-SC255 Software  :03/05/06 01:56PM
   AKA 65 Software Date:03/05/06 01:56PM
```

AK2-SC255 software build time & date

*To ensure error free connection, both time & dates for the AK2-SC255 software **and** the AKA65 should match. See appendix section for more details on AKA65 connections and file management*

When connected via the AKA65 software the build time & date is displayed.

Setting up for Ethernet communication
To connect to the AK2-SC255 via Ethernet and/or to have the AK2-SC255 become a node on a IP network it must have IP address information. From the main menu navigate to the 'Internet' menu via the 'Communications' menu.

Once in the Internet menu the **status** and **configuration** of the IP connection can be seen. To view the status of the AK2-SC255 select 'Status' and the IP address (if any) will be displayed. The following descriptions relate to this screen;

Use DNS: *Domain Name Servers - used when utilizing the AK2-SC255 to e-mail alarms - see Alarm Routing for more details*

Use DHCP: *Dynamic Host Control Protocol - allows a external server to assign an address to the AK2-SC255*

Default Gateway: *The address of the external server that assign an IP address to the AK2-SC255*

Network Mask: *An address assigned by the external server*

Master IP Address: *The Address of the Master AK2-SC255 unit (determined by the rotary switch in the actual AK2-SC255)*

To configure the IP settings for the AK2-SC255 select 'Config' from the Internet menu. From this screen all the above IP settings can be set.

To configure this part of the AK2-SC255 you will need to provide appropriate authorization.

The factory Authorization Code is   12345 (enter)
The factory Account Code is   50 (enter)

Typical AK2-SC255 setup when communicating over Ethernet

If AK2-SC255 is to be configured to send alarms via e-mail the DNS line needs to be set
(see your system administrator for settings)

Use the F2 button as a short cut to the Authorization dialog box

Network Scan & System Configuration
(On-Line configuration)

After the initial settings have been configured, the AK2-SC255 can now be prepared for Network scan(s). A network scan function is used in the AK2-SC255 to establish what controller devices or nodes are attached to the available network ports.
In this release of AK2-SC255 software the product can communicate to the different network protocol(s) below;

•Danfoss EKC & AK2 RS485 Lonworks®
•Danfoss EKC SNMP TCP/IP
•Danfoss EKC RS485 Modbus (Future support of EKC Modbus)
•Danfoss TP78 AK2 I/O

A current list of supported EKC and AK2 controllers can be found on document 'AK2-SC255 Factsheet' DKRCE.ED.R1.A1.22 / 520H1486

Network Scan
Use the Network Scan to capture all correctly connected Danfoss controllers and populate the AK2-SC255 database. All devices must have correct power, network cable, communication cards and net address prior to the Network scan.

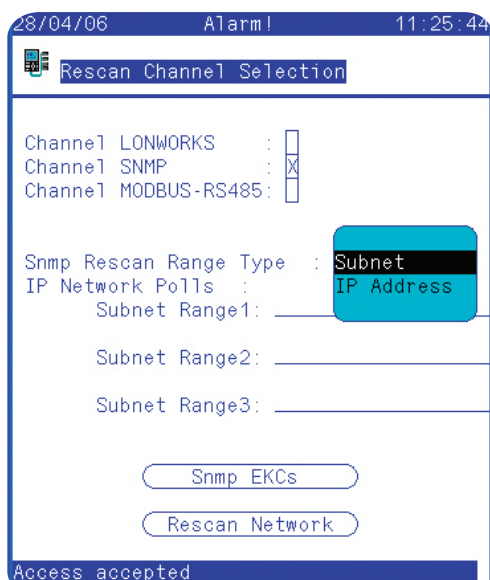From the Communications Menu select I/O Network

Communications   I/O Network
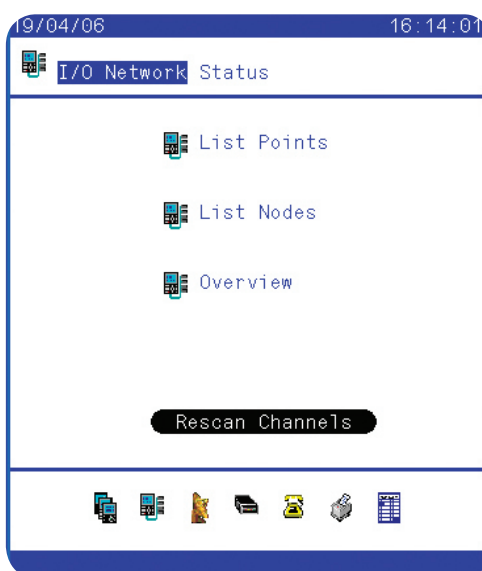
19/04/06 16:14:01	Select 'Rescan Channels' menu
I/O Network Status	
	Select the appropriate Network type(s)
List Points	
	X LonWorks® (Native TP78 - use bridge to convert to RS485 & FTT10)
List Nodes	X SNMP (Ethernet EKC controllers)
	X Modbus-RS485 (Future support)
Overview	
	If using SNMP TCP/IP controls ensure correct Subnet or IP range is set, see network administrator for address details.
Rescan Channels	

28/04/06   Alarm!   11:25:44

Rescan Channel Selection

Channel LONWORKS   :
Channel SNMP   :X
Channel MODBUS-RS485:

Snmp Rescan Range Type : Subnet
IP Network Polls   :   IP Address
    Subnet Range1:

    Subnet Range2: _____

    Subnet Range3: _____

        Snmp EKCs

        Rescan Network

Access accepted

Once set see the scan progress at the bottom of the screen.
First time scans occur automatically, however utilise the 'Rescan Network' button to force a new network scan at any time.

Using the 'Rescan Network' button will also generate a scan report indicating the quantity of nodes detected.

Network Scan Summery

Rescan Network Status

Complete rescan:

Nodes installed on network :0
Nodes configured in database:1
Nodes Detected in Internet :110

Press any key to continue ...
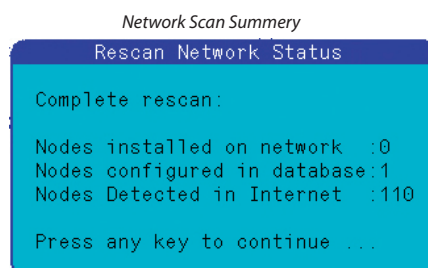
If SNMP TCP/IP controls are on the network, extra details can be seen by selecting the 'SNMP EKC's' button. The resulting list will contain all the detected EKC nodes. Use the 'Show' button to see additional EKC IP communication data.

```
19/04/06                    16:17:37

 ▦  Snmp EKC Controller - Rescan

Select LonID  IP Address       Details

     X   105  10.199.5.61       Show
     X   108  10.199.5.62       Show
     X   102  10.199.5.67       Show
     X   112  10.199.5.68       Show
     X   110  10.199.5.73       Show
     X    30  10.199.5.74       Show
     X   114  10.199.5.76       Show
     X   107  10.199.5.78       Show
     X    93  10.199.5.79       Show
     X   116  10.199.5.81       Show
     X    99  10.199.5.82       Show
     X   100  10.199.5.84       Show
     X    70  10.199.5.85       Show
     X   109  10.199.5.86       Show
     X   101  10.199.5.87       Show

 ( SORT )          "PG DN" for more 1/8
```
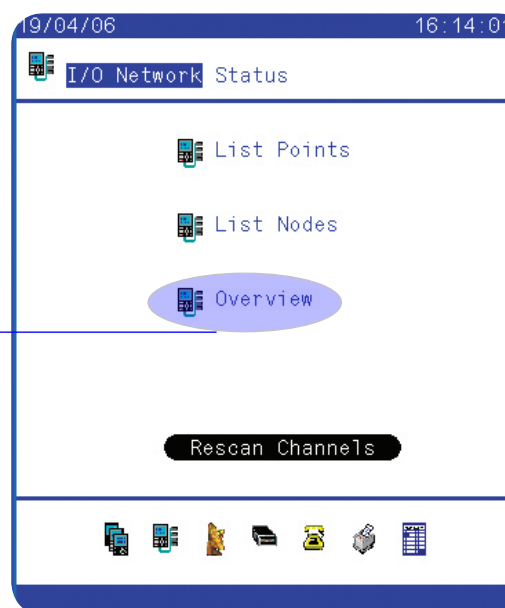
i Use the 'Show' button to see additional EKC IP communication data & to double check that communications are valid. The 'Sort' button is useful for organizing the device list.

Network Scan Results / Overview
Once the network scan(s) have been completed or at any time a list of connected devices is required, use the I/O Network Overview function.

```
19/04/06                    16:14:01

 ▦  I/O Network Status

         ▦  List Points

         ▦  List Nodes

         ▦  Overview

         ( Rescan Channels )
```

Select Overview from the I/O Network Status menu.

```
19/04/06                    16:19:14

 ▦  I/O Network Overview

         Configured : Installed

  0:0   OI8 Board      0:0   AKC 16x
  0:0   RO8 Board      0:0   DCU
  0:0   SI8 Board      0:0   Degree Master
  0:0   VO2 Board
                       0:0   AK2-CM
  0:0   VLT            0:NA  Calculations
  0:0   Utility Meter
  0:0   Bitzer         0:0   RTC
  0:0   Light Panel    0:0   ClimaTECH
  0:109 Generic        0:0   Carrier

     Nodes configured in database: 0
     Nodes available in database : 162
     Nodes installed on network  : 109
     Nodes available on network  : 53

Operation Successful
```

I/O Overview Page

Various configuration details can be seen from this page.

Select Generic to view EKC / AK2 'Generic' devices.

See the status of nodes (controllers) on the network.

i

Nodes Configured in database
After a new network scan this will show 0 and indicates that as yet no controllers have been setup in the AK2-SC255 database yet. (The commissioning phase will populate the database and therefore this value will reflect how many controllers are in the database).
Nodes available in database
Indicates how many controller (adresses(s)) are available
Nodes Installed on network
Indicates how many nodes have been recognized as a result of the scan
Nodes available on network
Indicate how many nodes (controller address's are still available)

AK2-SC255 Controller capacity is shown in the 'AK2-SC255 Fact sheet DKRCE.ED.R1.A1.22 / 520H1486)

Initial Pack and Evaporator setup
(on-line commissioning)

Assuming that no previous control devices have been configured in the system, new controls can now be added.
The commissioning of controls can be established by selecting the 'Configuration' menu - via the Main Menu and then Refrigeration.

From the Configuration menu select Refrigeration.

Select the 'Add Controls' option

In general the configuration of pack and evaporator controllers are grouped together creating a 'system relationship' between pack and evaporators. Later that relationship can be used to establish energy optimization to float the pack suction pressure. In this example the pack controller will be configured first , followed by the evaporator controllers.

Starting the controller configuration requires answering 'yes' to the question 'Pack Controller required?' Next provide the following information;

•Pack Description
•Pack network address

•Controller type

Next select the setup button and a pop up dialog box will appear to ask if the controllers configuration is required to be uploaded. If the Pack controller is powered up, correctly addressed and is present on the network option 1 can be made.

Option 1 will 'upload' the current controller data from the controller. Whilst in this 'commissioning' mode it is normal for the system to ask this question. If during this phase the controller details are not needed, simply press option 2 to negate an upload command.

Now that the initial Pack controller configuration has been set the remaining commissioning process can be completed. Start with the Pack Summary menu and then progress through the remaining function menus via the 'page tab'.

Use the navigational arrows on the keypad to select and modify the appropriate setting (see Appendix section for guidance on keypad operation). Scroll through the remaining function menus to ensure all parameters are set correctly. As the settings are changed this also has the effect of automatically writing down to the controller, thus the full commissioning can be completed by this method.

```
19/04/06                 16:47:13
                         «|||||||»
🐜  Pack Configuration

Addr: 91        Name: Pack 1
Suction Optimization? No
User file: None
Pack Summary            Settings
r23 Set Point b       0.6 Bar
r25 PoRefMax b        *40.0 Bar
r26 PoRefMin b        *0.0 Bar
r13 Night offset      *0.0 Bar
r27 NightSetBack      *ON
o22 DI4 control       *not used
r01 Neutral zone      *0.2 Bar
c10 + Zone b          *0.2 Bar
c11 + Zone m          *2.0 min
c12 ++ Zone m         *0.5 min
c13 - Zone b          *0.3 Bar
c14 - Zone m          *0.5 min
c15 -- Zone m         *0.3 min

(Init) (Upload)  (Copy)      (Alarms)
```

🔔 Configuration

'Page tab'
Use to scroll through the various function menus in the controller.

ⓘ   *Note on the Init and Upload functions*

The Init (Initialization) button is used to initialize or download settings FROM the AK2-SC255 database TO the control device(s). This function is used when an off-line database has been created and these settings need to be pushed down to the controller.

Use the Init button with care as this will cause any settings in the controller to be overwritten by Ak2-SC255.
Off-line programming is described later in the manual.

The Upload button is used when the current controller settings need to be uploaded FROM the controller TO the AK2-SC255 database.

AK2-SC255 Alarms
The Alarms button will open up the alarm configuration page. Here the AK2-SC255 can be configured to act on any of the controller alarm parameters.

-Disabled-
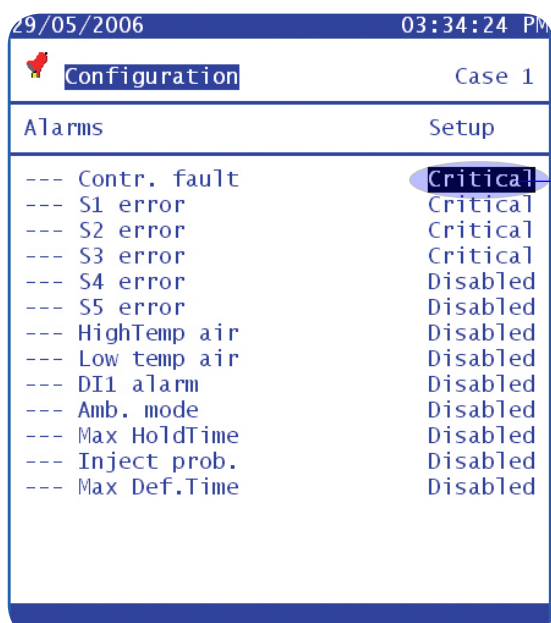No action will be taken (even if the controller is in alarm)
-Log Only-
No alarm action but will be logged in the Ak2-SC255 alarm list
-Normal-
AK2-SC255 will act upon controller alarm (Once)
-Critical-
Will continue to default alarm out every 10 mins. (10 - 99 mins configured in the Alarm Configuration/ Alarm Routing page)

```
29/05/2006            03:34:24 PM

🔔 Configuration           Case 1

Alarms                    Setup

--- Contr. fault         Critical
--- S1 error             Critical
--- S2 error             Critical
--- S3 error             Critical
--- S4 error             Disabled
--- S5 error             Disabled
--- HighTemp air         Disabled
--- Low temp air         Disabled
--- DI1 alarm            Disabled
--- Amb. mode            Disabled
--- Max HoldTime         Disabled
--- Inject prob.         Disabled
--- Max Def.Time         Disabled
```

Use the drop down list to select the alarm severity

Once the Pack controller has been configured the 'associated' evaporator controllers can be setup. This then 'links' the controllers to the pack ready for any optimization control that may be desired.

From the Refrigeration Configuration menu select the number of evaporators connected to the selected pack.

A number of evaporator controllers will now be displayed. At this page select the controller type via the drop down list.

Copy Function
If there are multiple controllers of the same type (controller type and software version) the 'Copy' function can be used.

For example if the associated controllers with *Pack 1* are of all the same type you need not replicate the drop down setup controller choice and parameter settings. The copy function allows the controller 'type', 'settings' and 'alarm configuration' to be copied into the system database. To 'paste' these settings down to the controller use the 'Init' (initialise) button (controller address must be in place at device and AK2-SC255 for the Init function to work)

Use the Init function with care as this will overwrite what ever settings are currently in the controller.

Using the same principle as described for the Pack controller configuration, the evaporator device(s) can now be set.

Page Tab

Device address & description

User File:
User customized file that changes the factory default text description, language, and history points that the user sees in the AK2-SC255. Used for customer tailored requirements. Contact your Danfoss representative for details and assistance on UDF file management.

A powerful and efficient way to quickly navigate through the commissioning pages (without having to go back to the Configuration / Refrigeration page) is to use the 'Prev' and 'Next' keys on the AK2-SC255 keypad or 'Control' + 'left / right arrow key' on a PC *when programming off-line.*

This navigation method allows for the same level page to be displayed but on a different device, thus greatly speeding up the navigation process.

Additional Pack and Controller combinations can be added via the Configuration / Refrigeration page. Select the 'Add Controls' button to repeat the process as previously described.

If the application does not have a Pack - Evaporator relationship (i.e. self contained devices, mobile units) simply answer 'No' to the question 'Pack controller required?' Continue to commission Evaporator devices as previously described.

Adding & Removing Individual Controllers
Post the commissioning process, should it be required to Add or Delete individual controllers the following methods can be used;

ADD a new controller by navigating to the Configuration / Refrigeration page, from there either select the associated Pack and increment the number of case controllers or select the 'Add Controls' button to add individual controller(s). If a controller is added to an existing Pack configuration it will be tagged at the bottom of that list.

REMOVING a Pack and associated controllers can be done by selecting the 'Remove' button from within a Pack configuration page. Both the Pack and associated controls will be deleted by this method.
By changing the number of case controls in a pack relationship can also delete them from the system. For example if a pack configuration has 30 associated evaporator devices and the 'number of controllers?' Is changed to 25 - the last 5 controllers will be deleted. You cannot specify an individual controller to be deleted from the system, it functions on a last in first out basis.

i

If there is a need to remove a controller(s) from the Evaporator overview page, the following method should be used;

Navigate to the Configuration / Refrigeration / Pack page.
Where it states how many case controllers there are select the 'Setup' button.
Locate the controller(s) that need to be removed from the system and change their type to '**None**'. This will have the effect of removing them from the Evaporator Overview page.

Configuration / Refrigeration / Pack page

Select controller type to 'None' to remove from the Evaporator overview list
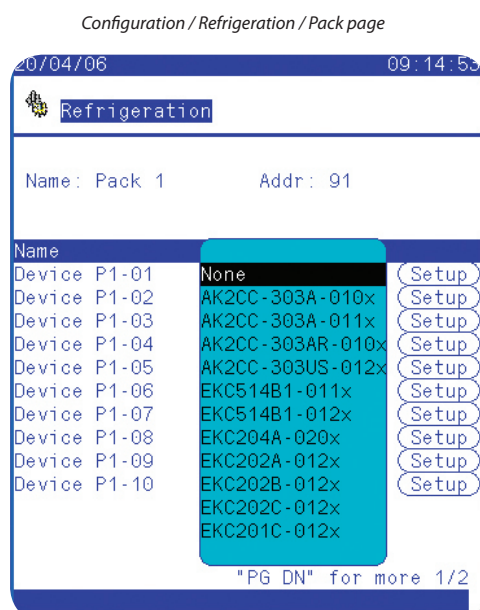
Master Control / Energy Optimization configuration

One of the major benefits of installing the AK2-SC255 and Danfoss controls is that intelligent functions known as Master Control can be configured. The proven concept of master control function is to provide system wide schedules, and targeted energy optimization control. The following section details the simple processes involved in creating, modifying and implementing these master control features.

Schedules

Schedule configuration and management can be accessed via the Configuration / Schedules page. Once in the Schedule Management screen the system asks for the number of schedules required. A maximum of 100 schedule types can be set and configured in the AK2-SC255 system. The available schedule types range from;

Misc -	Not currently used
Case Lighting -	Used to control the case lighting
Night Setback -	Used to control the automatic raising of controller setpoint at desired time (in association with Danfoss controllers)
Shutdown -	Used to automatically shut down a controller via the 'Main Switch' command
Defrost -	Used to control the complete refrigeration systems defrost schedule
Coord Defrost -	Used in conjunction with coordinated defrost feature in Danfoss controls

Schedule Management Page

Use the Service function to globally Enable or Disable ALL schedules

Enter number of schedules required

Using the drop down list, select the required schedule type

Case Lighting setup

Case lighting times vary from application to application but the following example highlights the process needed to configure and implement a typical store case lighting schedule. In this example Store A has case lights on for 24hrs from Monday through to Saturday night, with Sunday having specific on times. Select Case Lighting from the drop down list and continue to configure the schedule.

Check with the controller manual that the case lighting function is available.

Example - Store A

	ON		OFF
Mon	08:00		-
Tue		24hrs	
Wed		24hrs	
Thur		24hrs	
Fri		24hrs	
Sat	-		22:00
Sun	10:00		16:00

The resulting configuration in the AK2-SC255.

Ensure controllers are 'linked' to schedule

To complete the setup, select the controllers required for the schedule

Case Defrost setup

The AK2-SC255 has the facility to centrally manage a refrigeration network defrost schedules)
To configure a defrost schedule choose 'Defrost' from the drop down list, having previously added a new schedule in the initial Schedule management page.

Defrost Schedule

```
0/04/06        Alarm!        11:31:0
  Schedule Management

Schedule usage......?Defrost
Description.........?Case Defrost
Enable this schedule?No
Use auto-stagger....?Yes Interval:30min
Num of defrosts/day.?4
 Def.#01? 00:00    Def.#02? 06:00
 Def.#03? 12:00    Def.#04? 18:00




              Controllers
```

Give the defrost schedule an appropriate name
Choose to enable the schedule now or enable later
Use Auto-Stagger - If answered 'yes' an interval time should also be set
  Auto Stagger is the function where the AK2-Sc255 automatically calculates the next interval times and fills the next suggested defrost times in. This feature is primarily used where multiple defrost schedules are required and simply saves the user time in configuration.

```
Use auto-stagger....?Yes Interval:15min
Num of defrosts/day.?4
 Def.#01? 00:00    Def.#02? 06:00
 Def.#03? 12:00    Def.#04? 18:00
```

Auto Stagger auto fills in the next schedule times (incremented)

```
Use auto-stagger....?Yes Interval:15min
Num of defrosts/day.?4
 Def.#01? 00:15    Def.#02? 06:15
 Def.#03? 12:15    Def.#04? 18:15
```

Once the defrost schedule have been set, select the 'Controllers' button and assign the relevant controller(s).

Night Setback

The night setback function schedule is used to send a command signal to selected controllers on the network and thus enabling the raising of the operational setpoint (for the duration of the night setback) and / or for Rail heat control. Controller devices that get added to the night setback schedule will raise their control setpoint to the allotted values set in the controller during the schedule times. The night setback schedule can be used to save operational energy, especially when the use of night blinds are used in the display cabinets.

Using the same principles as previously described, select 'Night setback' as the required schedule. The configuration of the Start and Stop times should be made - thus stipulating when the night setback should be in operation. Outside of these times the selected controllers will operate with their 'normal' setpoints.

• Select Night Setback Schedule type
• Enter the time period that the setback will take effect
• Select the required days and / or holidays
• Select which controllers need to be affected by the schedule

```
18/06/2006              10:02:08 PM
  Schedule Managemen Misc.
                     Case Lighting
Schedule usage......? Night Setback
Description.........? Shutdown
Enable this schedule? Defrost
                     Coord Defrost
Num of schedules....?



   Start    Stop     Days    Holidays
#1 06:00 AM 12:00 PM SMTWRFA 12345678




              Controllers
```

Using the dropdown list, select night setback schedule type

Coordinated Defrost

From the drop down list select Coord Defrost. As seen in the regular defrost schedule provide start / and frequency times.

The principle of operation for coordinated defrost is to ensure a group of evaporators synchronize the defrost cycles, thus not having any undue effect on it's others operation. This function would typically be used when there is a series of refrigeration sections without any partitions and the running of the units would be affected if one in the row were to be in defrost at the same time when the others are in refrigeration modes.

Please also consult the controller manual for further set up information and configuration

Po Optimization (Pack suction pressure optimization)

The continuous and automatic optimization of the power pack suction pressure is performed by the central AK2-SC255. At ALL TIMES the appliance temperature has the highest priority thus ensuring that food quality is NEVER compromised.

The pack suction (Po) pressure is optimized in accordance with the refrigeration demand, taking into account short-term changes (day/night setback) and long-term effects (seasonal/weather changes).

Theory of operation

1/   The Ak2-SC255 receives operating information from each connected controller on the network.
2/   From the data received the AK2-SC255 will identify which evaporator controller is under the heaviest load (the one that has to work the hardest to maintain temperature)
3/   The AK2-SC255 then sends control signals to the Pack controller to optimize the running suction pressure. As the Pack controller allows the suction pressure to increase the AK2-SC255 monitors the complete network and ensures that the refrigerating system as a whole is stable. This then is a continuous function that once set runs automatically and ensures the refrigeration system is running to the best conditions.

This feature is available on all supported AK2-SC255 Evap & Pack controllers.
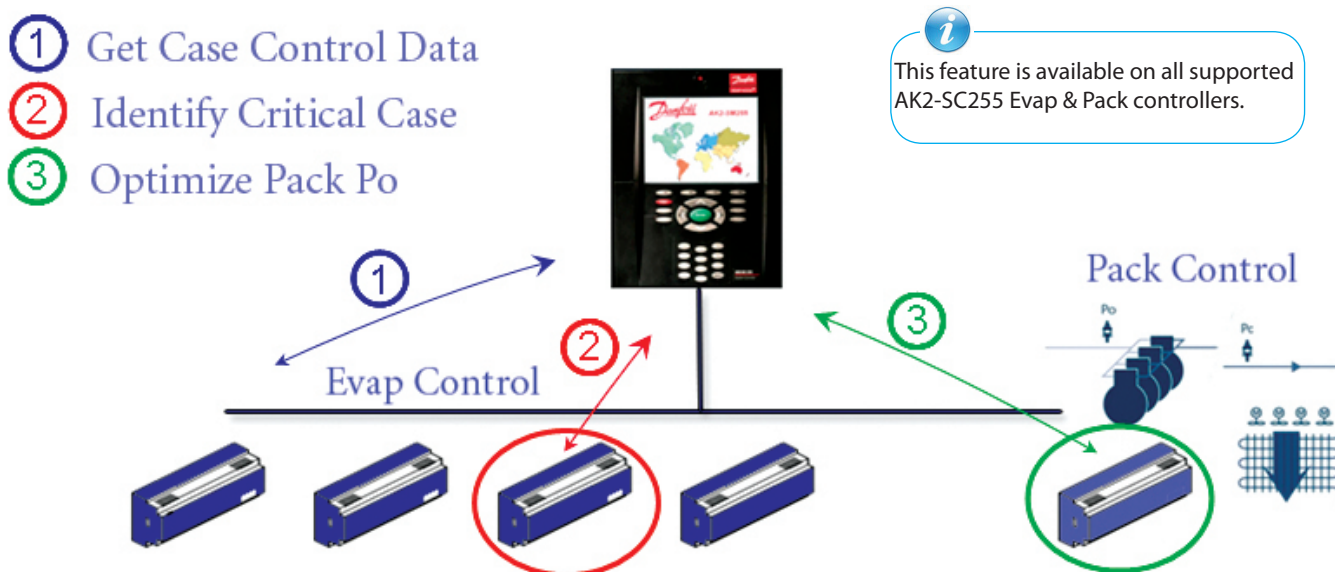
Configuration of suction optimization

To configure the AK2-SC255 system for pack optimization the system needs to recognise the Pack / Evaporator 'relationship'. This relationship was formed when a pack and associated evaporator controllers where configured.

Navigate to the Configuration / Refrigeration / Pack menu.

•Select the Setup button to enter into the Pack configuration page. Answer 'Yes' to the question 'Suction Optimization?'
•Set an appropriate Maximum pressure change that the optimization algorithm can make to the pack controller.
•Having done this the associated evaporator controllers will now show that suction optimization is in effect.
•If any evaporator controller(s) need to be released from the optimization function, navigate to the selected evaporator controller and select 'No' under the Suction Optimization? question.
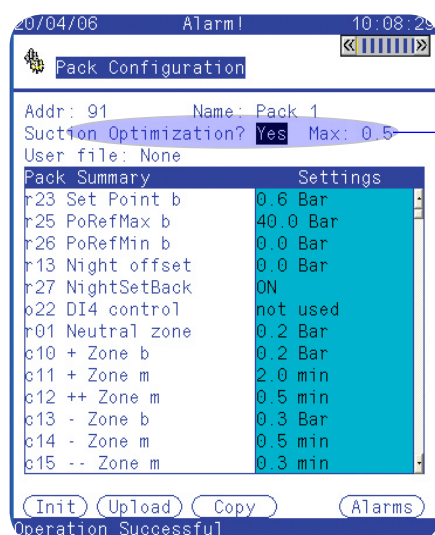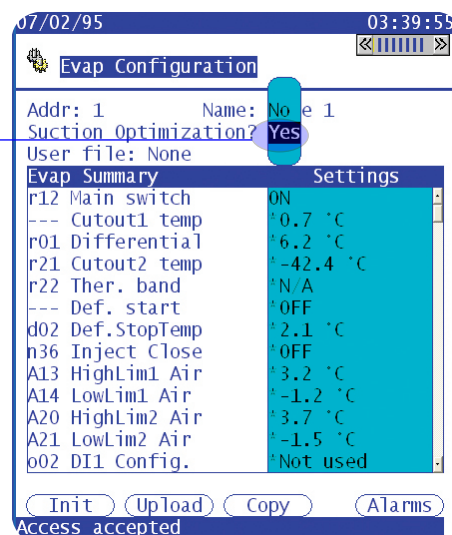

Pack Configuration:
•Switch optimization to 'yes'

•Select a Max pressure (after exiting & re-entering this screen)

Evaporator Configuration:
•Switch optimization to 'yes'

Viewing status & performance of Po Optimization

Subsequent to setting up the Po Optimization the status and running conditions can be viewed. At a quick glance the configured packs can be seen if the Po Optimization is 'Active' or 'Not Set' also the current running status .
From the Main Menu select 'Energy'

From the Energy Menu select 'Suction Optimization'. From the resulting screen the current Pack Po Optimization status can be seen, this status message is for information only but is a valuable tool in identifying under performing evaporators.

Selecting the relevant pack will bring up the Pack Optimization Graph screen. This 24 Hr. graph screen is designed to indicate which evaporator is under the most load and is continually updating. Any resulting pack pressure float will be seen in this menu and the target evaporator that is declared under the heaviest load will show a * beside the description. The upper bar indicates the total time (over the 24 Hr. period) that floating of the pack pressure has occurred.
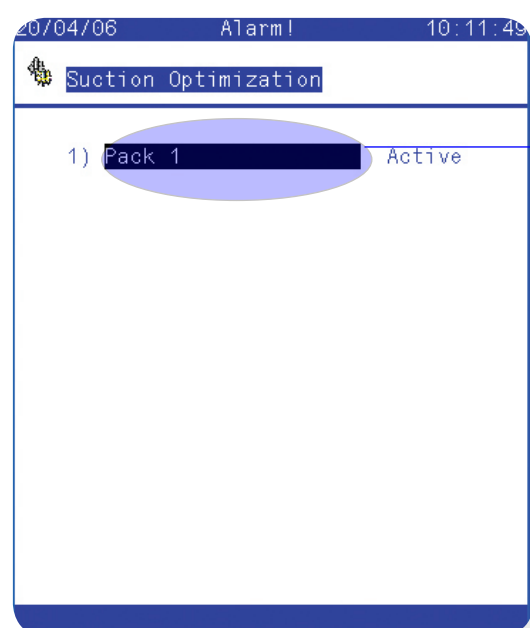
From the Suction Optimization menu a list of Packs can be seen with their status.

Use the Suction Optimization graph page to reveal which current evaporator is under the heaviest load (indicated by a *). The bars represent the duration of time (Hours & minutes) that each case has been operating outside of it's normal temperature range and declared the most loaded case.
If the * is displayed next to the line 'Floating Up' then all cases are satisfied.

See the amount of pressure float by observing the 'Adjust suction by' line
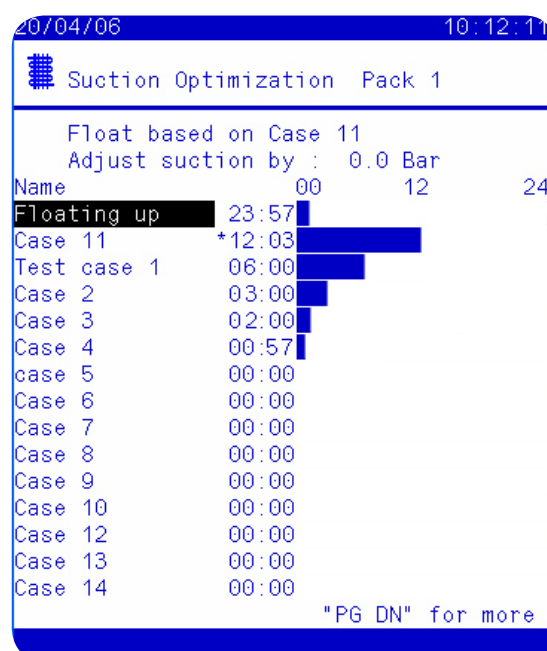
Optimization status graph

Rail Heat Control (via AK2 I/O modules)

If required the AK2-SC255 can be used to manage the energy output to the case trim heaters (Rail Heat). There are different ways to approach the solution to rail heat control, listed below are three main possibilities.

1 -   Use a Night Setback Schedule
Many Danfoss controls have a function whereby the output to the rail heat elements can be pulsed in a percentage of time ratio. If set in the controller, the night setback signal from the AK2-SC255 will allow the controller to vary the output depending on the time period. See the specific controller for more details

2 -   Use a 'Calculated' Dew point to control rail heat
By means of utilizing temperature and relative humidity sensors the AK2-SC255 can calculate the relative Dew point. Based on this Dew point reference and against a set point the output to the rail heat elements can be controlled. This represents 'tighter' control based on the calculated Dew point.

3 -   Use a true Dew point sensor
Utilizing a true Dew Point sensor allows the AK2-SC255 to control the output to he rail heat elements. As seen in the Calculated method the AK2-Sc255 will control the rail heat against assigned set points.

From the 'Configuration / Refrigeration / Pack List the 'Rail heat' button will be available.

Define how many relays will be used in the control of the rail heat elements (max 30)

Cycle time - Used to determine what amount of time the relays are energized, used in combination with the output percentage as set in the Dew point setpoint.

Example: *With a Dew point target range of -4.0 to 8.0°c and the Cycle time set for 10 minutes the following behavior will be true.*
*   At -4.0°c Dewpoint the relay output will be 0%*
*   At 8.0°c Dewpoint the relay output will be 100%*
*   At 2.0°c Dewpoint the relay output will be 50% of the cycle time (5 mins on, 5 mins off)*
*   At 7.0°c Dewpoint the relay output will be 90% of the cycle time (9 mins on, 1 min off)*

```
14/05/06                          20:18:33

  Rail Heat

Number of relays......? 4

Cycle Time...........?
                           Calc Dewpt
Dewpoint method.......? Dewpoint

Name            Bcast Bd-Pt  Type
Dewpoint        No    00-0.0 DPS100



                         (Setpoint)  (Relays)
```

Example of Target Dewpoint & relay output percentage ratio

Relay output percentage (based on cycle time setting)

Select a method of Dewpoint control. Two options are available;
      Dewpoint (Utilize direct output from dewpoint sensor)
      Calculated Dewpoint (Using a combined temperature / humidity sensor - type: EMHS3-1 is recommended)
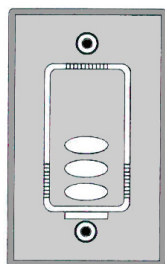
EMHS -3-1 Humidity Sensor (combined Humidity & Temperature):
24V supply
0-5V Relative Humidity
Temperature Sensor

| • Actual Dewpoint • | • Calculated Dewpoint • |
| requires Dewpoint sensor | requires combined Humidity & Temperature sensor |

```
14/05/06                    20:34:33

  🐞  Rail Heat

Number of relays......? 4

Cycle Time...........? 1    min

Dewpoint method.......? Dewpoint

Name           Bcast Bd-Pt  Type
Dewpoint        No    01-1.2 DPS100






            ( Setpoint )  ( Relays )
```
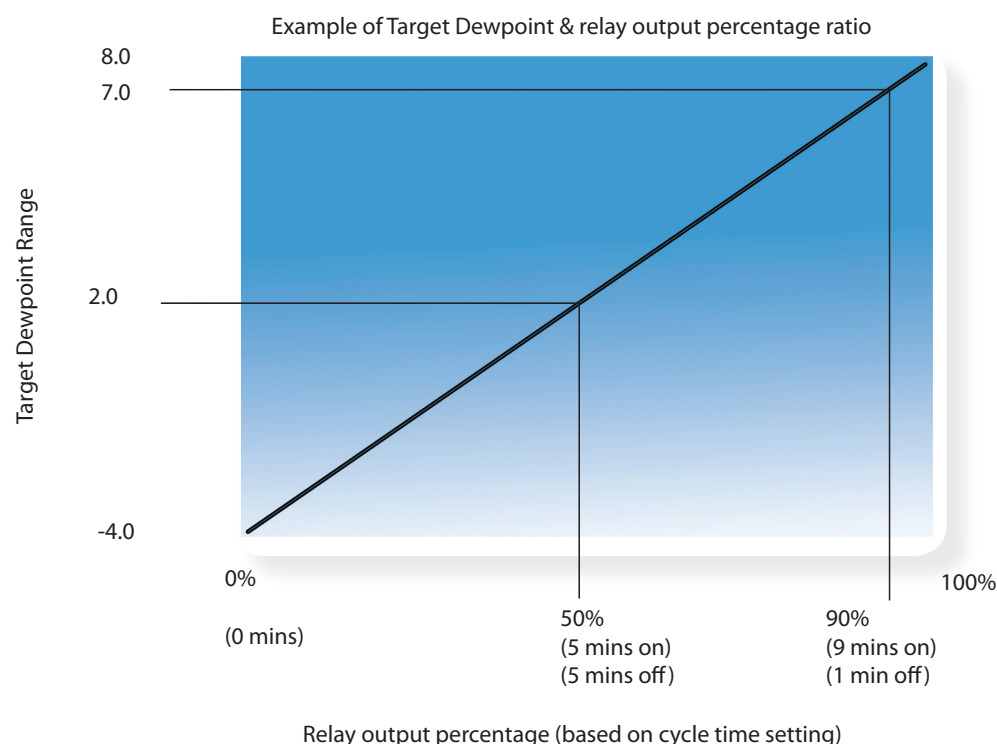
```
14/05/06                         ...
                            AKS32-200
  🐞  Rail Heat             AKS32-500
                            PHOTO-0D-1
                            PHOTO-ID
Number of relays......? 4   PT1000
                            DPS100
Cycle Time...........? 1    mECI TP-1
                            ECI TP-2
Dewpoint method.......? Calc NOVAR
                            THERM3
Name           Bcast Bd-Pt  THERM3-HT
Humidity        No    01-1.1 EMHS3
Temperature     No    01-1.2 EMHS4
                            1-6 Volts
                            0-5 Volts
                            1-2 Volts
                            CTTS
                            CPC501-1121
                            Elm
                            HGM CHAN
            ( Setpoint )  ( HGM LEAK
                                 ...
Humidity sensor (%)
```

Using Board & Point I/O specify the location of the Temperature & Humidity sensors

| Define the I/O relays that will | Define Dewpoint range: |
| 'drive' the rail heat output | Set the 0 & 100% output limits. |

```
14/05/06                    20:32:11

  🐞  Rail Heat


Name           Bcast Bd-Pt  Type
Rail Heat 1     No    02-1.1 N-Open
Rail Heat 2     No    02-1.2 N-Open
Rail Heat 3     No    02-1.3 N-Open
Rail Heat 4     No    02-1.4 N-Open
```

```
14/05/06                    20:30:39

  🐞  Rail Heat


Name           Dewpoint  Duty Cycle

Rail Heat 1     >   7.2°C     0 %
                <  -3.9°C   100 %

Rail Heat 2     >   7.2°C     0 %
                <  -3.9°C   100 %

Rail Heat 3     >   7.2°C     0 %
                <  -3.9°C   100 %

Rail Heat 4     >   7.2°C     0 %
                <  -3.9°C   100 %
```
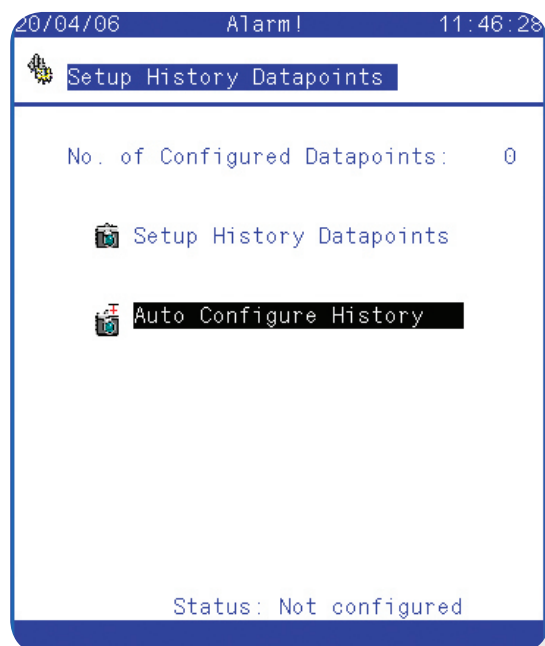
History (Parameter, food safety logging)

The AK2-SC255 is capable of storing recorded data from devices and I/O on the network(s). Use the following steps to quickly set up and view stored data. It is recommended that if large amounts of data be stored at high frequencies the use of a permanently connected PC running AKA65 software should be deployed. The connected PC can be scheduled to extract and save system history, the AKA65 software also has greater graphing tools that enable deeper analysis of data and also the facility to export to spreadsheet formats.

First get authorized
Then navigate via the main menu to 'History'   History

```
20/04/06          Alarm!        11:46:28

   Setup History Datapoints


   No. of Configured Datapoints:   0


      Setup History Datapoints


      Auto Configure History








           Status: Not configured
```
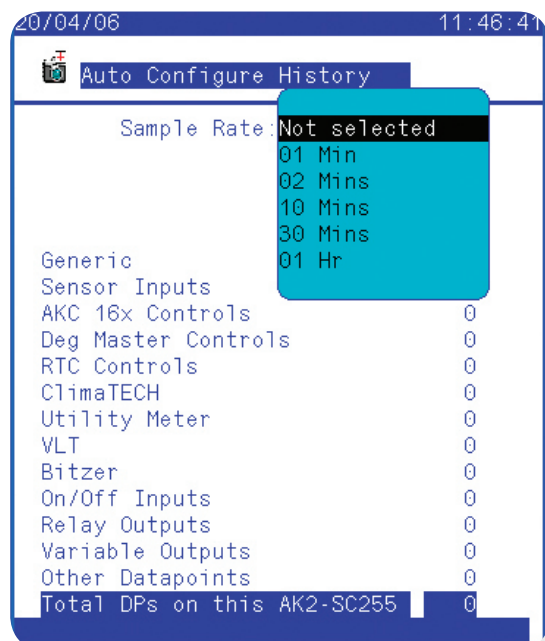
Select Configure History option

Two options are available on this screen;
 Setup History Datapoints (manually define points)
 Auto Configure History (factory pre set points to enable quick start logging. If the factory settings are not per requirements manual additions / alterations can be made post the auto configure setup.)

Clear History Datapoints (may be visible if the system has pre defined points)

Select Auto Configure History

```
20/04/06                        11:46:41

   Auto Configure History

      Sample Rate: Not selected
                   01 Min
                   02 Mins
                   10 Mins
                   30 Mins
   Generic         01 Hr
   Sensor Inputs
   AKC 16x Controls              0
   Deg Master Controls           0
   RTC Controls                  0
   ClimaTECH                     0
   Utility Meter                 0
   VLT                           0
   Bitzer                        0
   On/Off Inputs                 0
   Relay Outputs                 0
   Variable Outputs              0
   Other Datapoints              0
   Total DPs on this AK2-SC255   0
```

Next define the sample rate via the drop down box.

As part of this setup all previous configured history (if any) will be deleted. To proceed further the AK2-SC255 will hold a question asking 'Do you want to Auto Configure...?' - Select **yes** to continue.

The total data points (DP's) that get used in the history will be displayed at the bottom of the screen. The AK2-SC255 has a current capacity of 600 points. Exit once out of this screen.

To finalize the auto configure process, collection of history needs to be started. The screen that is now displayed will show a large button called 'Start History'. Press this button to activate the auto history collection. The status at the bottom of the screen will now show 'collecting'.

History - Manual configuration

If the Auto history configuration is not sufficient for the application and additional / different points are needed, manual setup can be used.

From the Configuration page navigate to /History/Configure History.

Select the option 'Setup History Datapoints'

The Configure History page will now be shown. The AK2-SC255 has many different variables it can log, thus the lower section of this screen will show various icons. In this example the term **'Other Controllers'** is used to describe EKC and AK2 controllers.
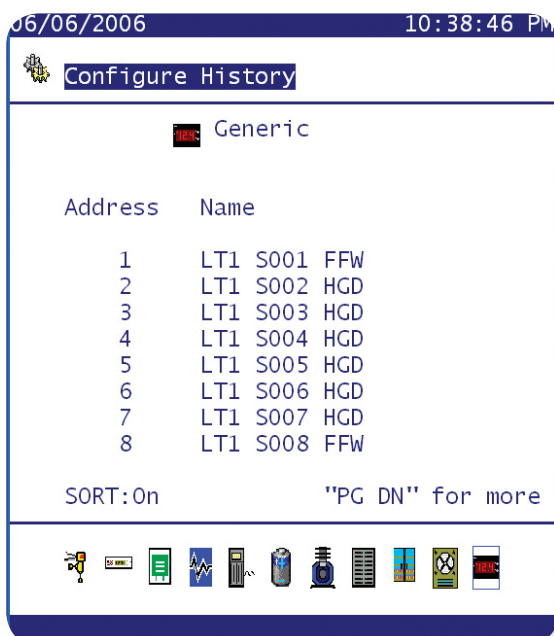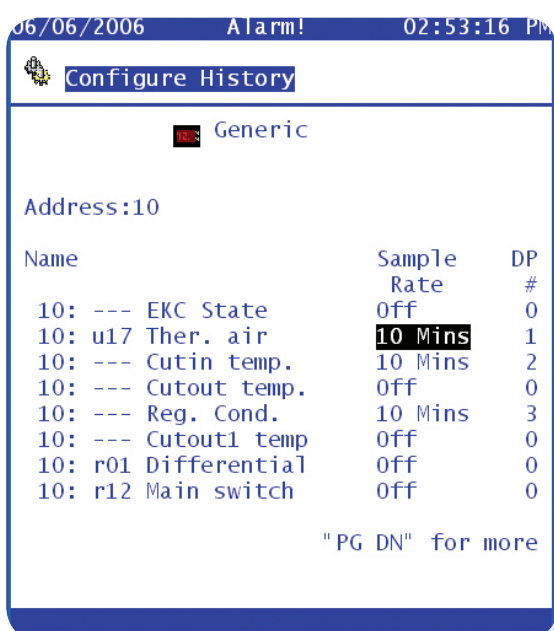

Other Controllers icon

Select the 'Other Controllers' icon
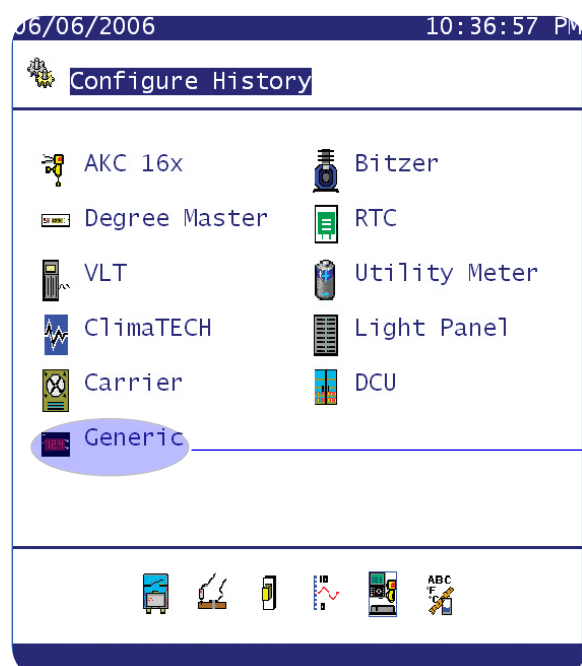
The screen now highlights various controller types.

To view EKC and AK2 controllers select **'Generic'**.

```
06/06/2006                    10:38:46 PM

  ⚙ Configure History

            ▨  Generic


     Address    Name

          1     LT1 S001 FFW
          2     LT1 S002 HGD
          3     LT1 S003 HGD
          4     LT1 S004 HGD
          5     LT1 S005 HGD
          6     LT1 S006 HGD
          7     LT1 S007 HGD
          8     LT1 S008 FFW

     SORT:On          "PG DN" for more

  ⚒ 🔲 📊 〰 📇 🔋 🎛 📑 🎚 ❎ ▨
```

Having selected 'Generic' the available connected controllers will be displayed. The list will indicate the controllers net ID address and the description.

Use the Page Up & Page Down button (up / down arrow on PC) to scroll through this list.

```
06/06/2006       Alarm!       02:53:16 PM

  ⚙ Configure History

            ▨  Generic


  Address:10

  Name                  Sample    DP
                         Rate      #
   10: --- EKC State     Off       0
   10: u17 Ther. air    [10 Mins]  1
   10: --- Cutin temp.   10 Mins   2
   10: --- Cutout temp.  Off       0
   10: --- Reg. Cond.    10 Mins   3
   10: --- Cutout1 temp  Off       0
   10: r01 Differential  Off       0
   10: r12 Main switch   Off       0

                  "PG DN" for more
```

To make a change in any one of the controllers listed, highlight the device and press enter.

The screen now shows the selected controller and all the available parameters that can be changed. Scroll down the list of parameters and highlight the item that requires change.

Use the Edit key (right mouse click on PC) to bring up selectable sample rates - choose sample rate and enter. Note after this change the Data point number increases highlighting that one available database point has been taken up.

Exit out of the screen(s)

```
   Start History
```

ⓘ

Ensure that the status of the history is set to 'Collecting' and not Suspended. Always select 'Start History' to ensure logging

Daily User

To cater for the daily user actions and requirements the AK2-SC255 has a simple set of screens that provide access to the key areas of food safety and alarm information. Typically the user authorization for daily users will have been predefined by the commissioning process and thus when a daily user logs into the system a limited range of screens are available. For the daily user the AK2-SC255 system will be used to highlight any alarms in the refrigeration system, check on key parameters and to allow repetitive tasks to be done easily. The following screens are examples of what the daily user can expect to see when performing the day to day management of the refrigeration / food safety checks.

Evap Overview (Pack view accessed by pack icon)

Evap Overview with x2 controllers offline

One of the main screens available to the daily user is the 'Evap Overview page'. This page simply lists all the evaporators on the network and provides the user with key 'first look' information. The list highlights the controllers network address, description (as set in the commissioning process), the current temperature value (Therm Air) and the controllers status. The status column describes in generic terms what status the controller is in and also comes with the relevant controller status code (seen in brackets). Refer to the controller manual for more information on this status code. If a particular controller has been turned off or has communication issues this will be highlighted by a solid red line, in this instance further investigations will be needed to rectify the fault.

By selecting one of the controllers in the list the 'Evap Summary page' is shown. This page provides specific details on the controller that has been selected and is referred to as the Evap summary. The parameters shown in this list are factory set but can be customer defined via the User definition file (see Appendix for further details on User Defined files). The concept behind this summary list is that out of many available parameters only the key ones are visible, thus simplifying the daily interface to the evaporator.

The screen is broken up into three main sections that allow for easy interaction with the controller;

The upper section has a drop down list that allows for fast controller selection. There is also a constant feedback on the controllers temperature value and status.

The Mid section holds the controller summary parameters, a scroll bar to the right indicates that further information is down the screen so the use of the page down key will expose these parameters.

The bottom section contains useful short cut icons. Use these icons to jump to;
Authorization, Main Overview page, Schedules, F1 - Manual Overrides, History, Alarms

Once at this screen level, a quick way to scroll through the other controller devices is to use the **Prev / Next** keys.

```
        ...              06:21:36 PM
 37 - Device P2-10
 38 - Device P2-11
 39 - Device P2-12      Status
 40 - Device P2-13      (s28) Ambient
 41 - Device P2-14
 42 - Device P2-15          Measures
 43 - Device P2-16      (s28) Ambient
 44 - Device P2-17      -17.6 °C
 45 - Device P2-18      0 min
112 - Pack 3            13.3 °C
 46 - Device P3-01      -6.9 °C
 47 - Device P3-02      0 %
 48 - Device P3-03      OFF
 49 - Device P3-04      26.4 °C
 50 - Device P3-05      25.4 °C
 51 - Device P3-06      OFF
 52 - Device P3-07      13.0 °C
 53 - Device P3-08      On
 54 - Device P3-09
 55 - Device P3-10          F2
 56 - Device P3-11
 57 - Device P3-12
        ...              m Generic
```
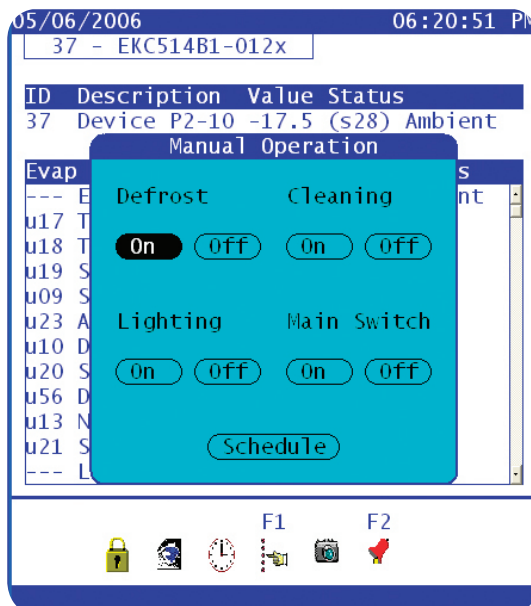
Whilst in the upper section of the Evap summary screen the use of the drop down box can be used to quickly access other controllers on the network. This feature is especially useful if there is a large network present.

Manual Operation

In order to assist in the operation of frequently used or key controller functions the AK2-SC255 has a easy to use 'F1 Manual Operation' function. By pressing the F1 key whilst in the Evap Summary screen the user can bring up a options box that allows key operational functions. Select the appropriate manual operation and the system will ask for confirmation (do not use the F keys for this confirmation). Be aware that some manual override operations may cause stock loss if not used correctly i.e. Main Switch will stop refrigeration to the evaporator device. The user must have correct authorization in order to use the manual operation function.

```
05/06/2006               06:20:51 PM
  37 - EKC514B1-012x

ID  Description  Value Status
37  Device P2-10 -17.5 (s28) Ambient
Evap                              s
        Manual Operation
--- E                           nt
u17 T  Defrost       Cleaning
u18 T
u19 S  [On] (Off)   (On) (Off)
u09 S
u23 A  Lighting      Main Switch
u10 D
u20 S  (On) (Off)   (On) (Off)
u56 D
u13 N
u21 S      (Schedule)
--- L

              F1      F2
```

Manual Operations

- Defrost - Triggers manual defrost

- Cleaning - Triggers 'Fans Only mode' in controller

- Lighting - 'Toggles case lighting on/off

- Main Switch - Turns controller on/off

- Schedule - quick link button to schedule management page

Some controllers may not support the manual operations - check controller manual for more details.
Note that if no manual operation is required whilst in this page select 'Escape' to exit from the pop up box.
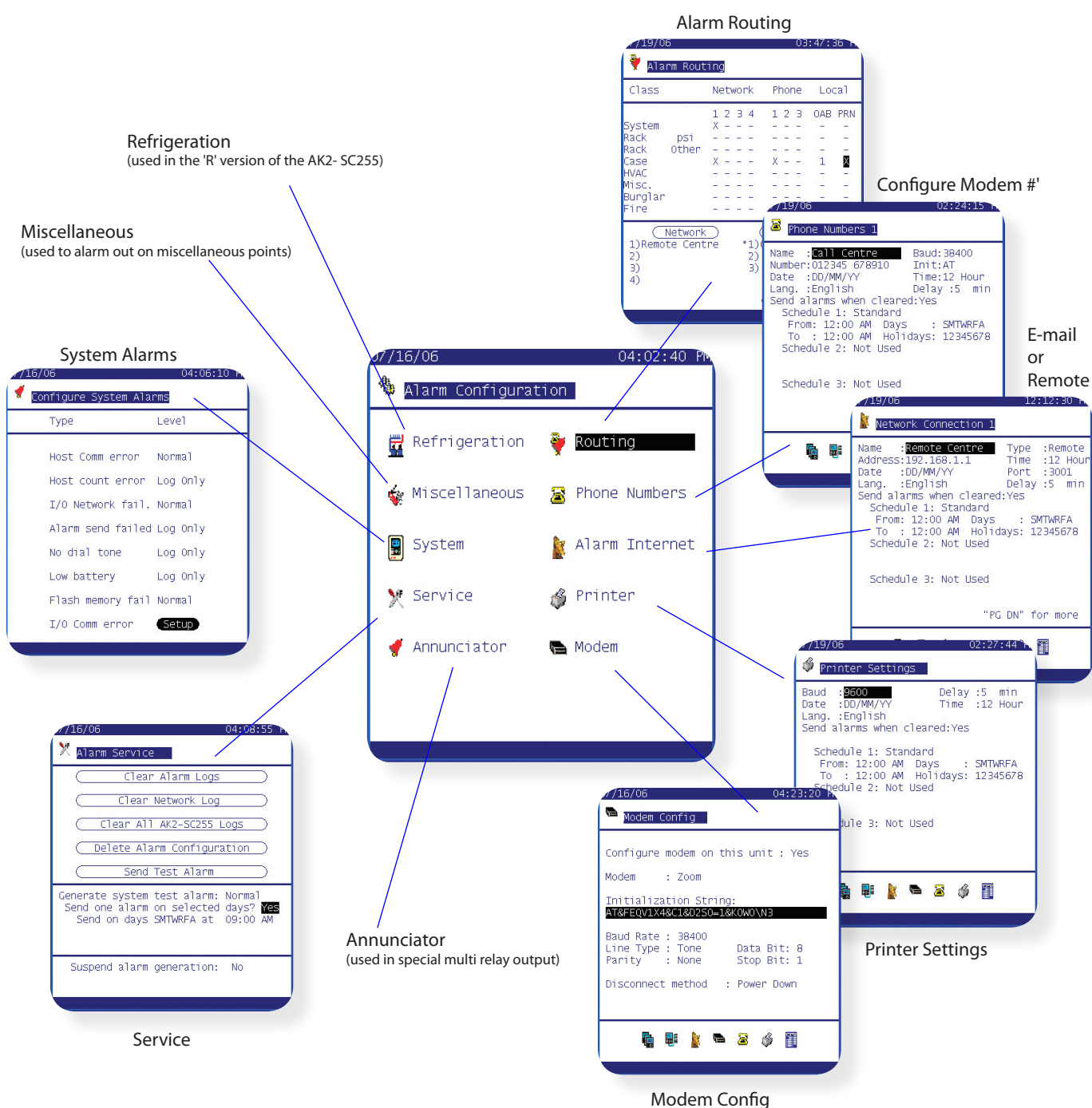
Alarm Routing (Generic EKC & AK2 controllers)

The AK2-SC255 receives data from the connected controllers, sensors and inputs, when an alarm occurs the AK2-SC255 can route the alarm(s) to certain destinations.

Generic (EKC & AK2 devices) have their own alarm setpoints held within the controller. Upon the breach of the alarm limit (and any time delay) the controller will send an alarm to the AK2-SC255. The AK2-SC255 then has different options, defined as alarm routing to forward the alarm to different locations.

For AK2 I/O and general inputs the alarm limits and time delay can be set locally in the AK2-SC255.
In both scenarios there are various options available to route the alarm 'out', the following section describes the typical setup for EKC & AK2 devices.

Alarm Configuration Page *(Main menu / Configuration / Alarms)*

Alarm Routing

Refrigeration
(used in the 'R' version of the AK2- SC255)

Configure Modem #'

Miscellaneous
(used to alarm out on miscellaneous points)

System Alarms

E-mail
or
Remote

Service

Annunciator
(used in special multi relay output)

Printer Settings

Modem Config

The following alarm routing options are available;

•Alarm 'text string' output via Ethernet / e-mail
•Alarm 'text string' output via analogue modem connection
•Alarm to OAB (Office Alarm Box)
•Alarm print out via local serial printer

Navigate to the Alarm Configuration page via the Main menu / Configuration / Alarms. Select Routing.

The AK2-SC255 has the capacity to manage alarms from a multitude of control areas. These areas are known as '**Class**' groups and are listed on the left had side of the Alarm Routing page.

When using Generic (EKC & AK2) controllers select the class '**Case**'. This is true for both case & pack controls.

Note that the class 'System' is also checked, as this enables AK2-SC255 system and controller off-line alarms.

```
07/19/06                    03:47:36 PM
 🐦 Alarm Routing

 Class           Network   Phone  Local

                1 2 3 4   1 2 3  OAB PRN
System          X - - -   - - -   -   -
Rack     psi    - - - -   - - -   -   -
Rack   Other    - - - -   - - -   -   -
Case            X - - -   X - -   1   X
HVAC            - - - -   - - -   -   -
Misc.           - - - -   - - -   -   -
Burglar         - - - -   - - -   -   -
Fire            - - - -   - - -   -   -

    ( Network )        ( Phone Numbers )
 1)Remote Centre    *1)Call Centre
 2)                   2)
 3)                   3)
 4)

                          "PG DN" for more
```

The Alarm Routing page offers up to 4 network (IP address or e-mail), 3 phone numbers, Office Alarm Box (OAB), and printer routes.

In order to direct the alarms to an IP address, Phone, OAB and printer, select an x to the appropriate column.

Use the 'Network' and 'Phone Numbers' buttons to program the appropriate details

Example
The following example shows how to program the AK2-SC255 to route alarms from an EKC / AK2 network. In this example when an alarm occurs, the AK2-SC255 will forward to an IP address, e-mail address, send to a printer and get the on board red light to illuminate and the siren to sound.

1/ Navigate to the Alarm Config page
 Set the network, phone and local columns Class as 'Case' (as seen in diagram above). The diagram above is set so that when an alarm is raised from a controller it will get routed to an IP address, modem number, local light / buzzer and the printer.

2/ Press 'Page Down'
Configure the next set of routing criteria

```
07/16/06                    04:11:44 PM
 🐦 Alarm Routing


 Send critical alarms, every  10  minutes


 Alarm Routing   AK2-SC255
                 Address
 Phone Modem        0
 Ethernet           0
 RS232 IP           0
 Printer            0


 Alarm Logger  :Disabled




                         "PG DN" for more
```

Select the time interval that a critical alarm get's re-transmitted (min 10 mins)

If using multiple connected AK2-SC255 units select the system that will be responsible for alarm routing. The 'Master' AK2-SC255 in a network will always be address 0.

Alarm logger - leave as disabled.

3/ 'Page Down'

View the final page in the alarm routing setup.

To energize the red LED and buzzer on the AK2-SC255 an OAB (Office Alarm Box) needs to be configured. The AK2-SC255 can handle up to 8 OAB units, but in this example only 1 OAB is used. OAB address 1 was already set in the first alarm routing page so here we add a 'dummy' board & point address.

```
07/19/06              11:36:45 AM

 🐓 Alarm Routing


 Alarm Box configuration

OAB AK2-SC255 Alarm Box Enabler  Input
 #    Address    Bd-Pt    Input   Bd-Pt
 1:      0       01-1.1     No
 2:      0
 3:      0
 4:      0
 5:      0
 6:      0
 7:      0
 8:      0


 Automatic OAB retrigger? No



 Enable internal OAB....? Yes
 Flash with external OAB# 1
```

Enter a fictitious board & point for the OAB and set Enabler Input to 'No'

Select 'Yes' to enable internal OAB - this allows the AK2-SC255 red light & buzzer to function upon receipt of any alarms. Ensure that the correct OAB number is assigned to this function, remove any unwanted address's.

4/ Navigate back to the main Alarm Routing page

Select the **Network** button, located at the bottom of the screen. The Network Connection 1 page will now be displayed.

The example here will send the alarm (text string) to a remote call centre i.e. Danfoss Retail Care. Ensure 'Remote' is selected from the drop down list and then fill the Name and address details - where the address is the remote IP or DNS address. Select the appropriate delay and declare if alarm clearance signals need to be sent.

5/ Select 'Page Down'

Enter the *Network Connection 2* details, here the e-mail configuration can be done.   Start by checking the date format, sending alarms after they clear and by selecting a schedule.

> ℹ️ Be sure to select a schedule for 'Remote' and 'e-mail' else the alarms will not be sent.
> The pre-set schedule allows for alarms to be sent at any time (12:00 - 12:00 or 00:00 - 00:00)

Remote Network

```
07/19/06              12:12:30 PM

 🐓 Network Connection 1

Name  :Remote Centre   Type  :Remote
Address:192.168.1.1    Time  :12 Hour
Date   :DD/MM/YY       Port  :3001
Lang.  :English        Delay :5  min
Send alarms when cleared:Yes
  Schedule 1: Standard
   From: 12:00 AM  Days   : SMTWRFA
   To  : 12:00 AM  Holidays: 12345678
  Schedule 2: Not Used


  Schedule 3: Not Used


              "PG DN" for more
```

E-mail

```
07/19/06              12:13:46 PM

 🐓 Network Connection 2

( E-Mail Configuration ) Type  :E-Mail
                         Time  :12 Hour
Date   :DD/MM/YY         Port  :25
Lang.  :English
Send alarms when cleared:Yes
  Schedule 1: Standard
   From: 12:00 AM  Days    : SMTWRFA
   To  : 12:00 AM  Holidays: 12345678
  Schedule 2: Not Used


  Schedule 3: Not Used


              "PG DN" for more
```

6/ Next select the e-mail button to bring up e-mail configuration screen.

Fill in the Server, Send To and reply to sections. Be sure to enter a 'reply to' address to ensure correct e-mail output.

```
07/18/06              05:06:27 PM

   E-Mail Configuration

Server
snmp.danfoss.net

Send To
1)myaddress@danfoss.com

2)youraddress@danfoss.com

3)_____

4)_____

5)_____

Reply To
1)myaddress@danfoss.com
                              No
Send abbreviated alarm message?Yes
```

Server - The address (IP or DNS) of the supporting host server

Send to - The e-mail address of the recipient of the alarm. Max 5 address's

Reply to - Typically a mail server requirements - add a relevant address

Send abbreviated alarm - a shortened message suitable for mobile phone / PDA use.

7/ Next navigate back to the main Alarm routing page.

Select the 'Phone Numbers' button located at the bottom of the screen. Fill in details for the Name, phone number, date format, baud rate and if cleared alarms get sent. Remember to set a schedule for this number.

Navigate back to the main Alarm routing page to check all routing options have been set.

```
07/19/06              02:24:15 PM

   Phone Numbers 1

Name  :Call Centre    Baud:38400
Number:012345 678910  Init:AT
Date  :DD/MM/YY       Time:12 Hour
Lang. :English        Delay :5  min
Send alarms when cleared:Yes
   Schedule 1: Standard
    From: 12:00 AM  Days   : SMTWRFA
    To  : 12:00 AM  Holidays: 12345678
   Schedule 2: Not Used


   Schedule 3: Not Used


              "PG DN" for more
```

```
07/19/06              03:47:36 PM

   Alarm Routing

Class          Network    Phone    Local

               1 2 3 4   1 2 3   OAB PRN
System         X - - -   - - -    -   -
Rack    psi    - - - -   - - -    -   -
Rack    Other  - - - -   - - -    -   -
Case           X - - -   X - -    1   X
HVAC           - - - -   - - -    -   -
Misc.          - - - -   - - -    -   -
Burglar        - - - -   - - -    -   -
Fire           - - - -   - - -    -   -

  ( Network )        ( Phone Numbers )
1)Remote Centre    *1)Call Centre
2)                   2)
3)                   3)
4)

              "PG DN" for more
```
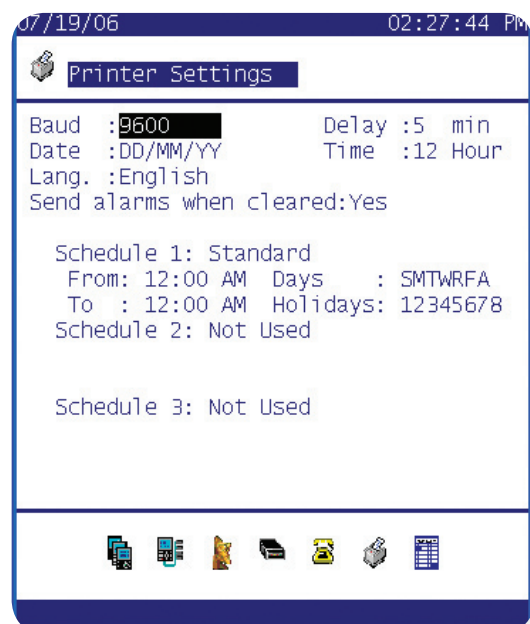
Alarm Routing -summary

For Generic controllers (EKC & AK2) use the 'Case' class. To send alarm out via network & Phone ensure a 'X' is assigned. Also in this example the AK2-SC255 will flash and sound the siren the OAB column is marked with a 1. The printer column is also marked to send the alarm to the printer.

8/ Now that the Alarm Routing page has been configured the printer and modem need to be set.
Navigate to the Alarm Configuration page (one step back form the alarm routing page). Select 'Printer' to configure output to serial dot matrix printer (Epson LX300 or similar).
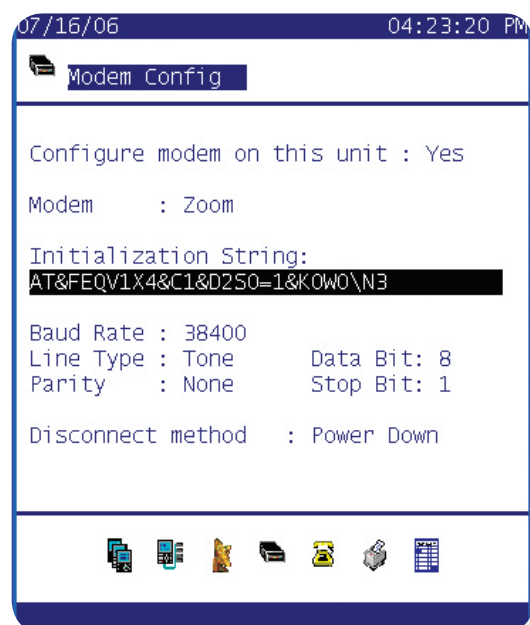
```
07/19/06                02:27:44 PM
  🖨 Printer Settings

Baud  :9600       Delay :5  min
Date  :DD/MM/YY   Time  :12 Hour
Lang. :English
Send alarms when cleared:Yes

   Schedule 1: Standard
    From: 12:00 AM  Days   : SMTWRFA
    To  : 12:00 AM  Holidays: 12345678
   Schedule 2: Not Used


   Schedule 3: Not Used
```

As with network & phone routing, ensure that a schedule has been defined to allow for the printout.

9/ Navigate back to the Alarm Configuration page and select 'Modem'.
Select 'yes' to the question "Configure modem on this unit".
Against the modem line select the appropriate modem type. Continue to configure the remaining modem setup, baud rate, line type, parity, data & stop bits.

The Disconnect method relates to the use of the modem adaptor (080Z2100) which toggles the modem power upon alarm delivery. If the modem adaptor is used set the disconnect method to power down.

```
07/16/06                04:23:20 PM
  ✉ Modem Config

Configure modem on this unit : Yes

Modem    : Zoom

Initialization String:
AT&FEQV1X4&C1&D2S0=1&K0W0\N3

Baud Rate : 38400
Line Type : Tone      Data Bit: 8
Parity    : None      Stop Bit: 1

Disconnect method   : Power Down
```

Modem Adaptor 080Z2100 used to toggle power to the modem.
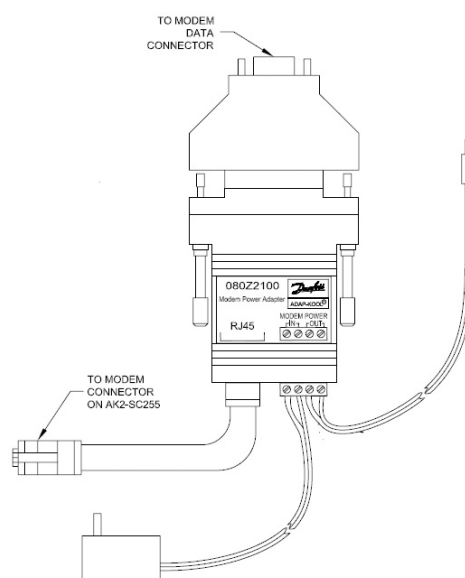
10/ Send a test alarm and configure a daily test alarm.
In order to test the alarm setup and to configure a daily test alarm select 'Service' from the Alarm Configuration page.

```
07/16/06                04:08:55 PM
  X  Alarm Service

      (      Clear Alarm Logs      )

      (      Clear Network Log     )

      (    Clear All AK2-SC255 Logs )

      (  Delete Alarm Configuration )

      (      Send Test Alarm       )

  Generate system test alarm: Normal
   Send one alarm on selected days? Yes
      Send on days SMTWRFA at  09:00 AM


      Suspend alarm generation:  No
```

Use the 'Send Test Alarm' button to force a test alarm

If a daily test alarm is required then select from the drop down options for alarm type (Disabled, Log Only, Normal, Critical)

If required set the selected day or define the time interval.

11/ Configure the AK2-SC255 'System Alarms' & controller 'Offline alarm'
Various alarms can be configured based on AK2-SC255 alarm points. Select 'System' from the Alarm Configuration page.

```
07/16/06                04:06:10 PM
  🔔 Configure System Alarms

     Type              Level

     Host Comm error    Normal

     Host count error  Log Only

     I/O Network fail. Normal

     Alarm send failed Log Only

     No dial tone       Log Only

     Low battery        Log Only

     Flash memory fail Normal

     I/O Comm error     ( Setup )
```

```
07/16/06                04:06:10 PM
  🔔 Configure System Alarms

     Type              Level

     Host Comm error    Normal

     Host count error  Log Only

     I/O Network fail. Normal

     Alarm send failed Log Only

     No dial tone       Log Only

     Low battery        Log Only

     Flash memory fail Normal

     I/O Comm error     ( Setup )
```

Select the relevant alarm types for the various 'System' alarm points

To check and modify the controller 'offline' alarm state select the setup button for I/O Comm error.

From the setup button, navigate to the 'Other Controllers' icon. Next select the 'Generic' icon to view all the generic devices on the network / AK2-SC255 database.
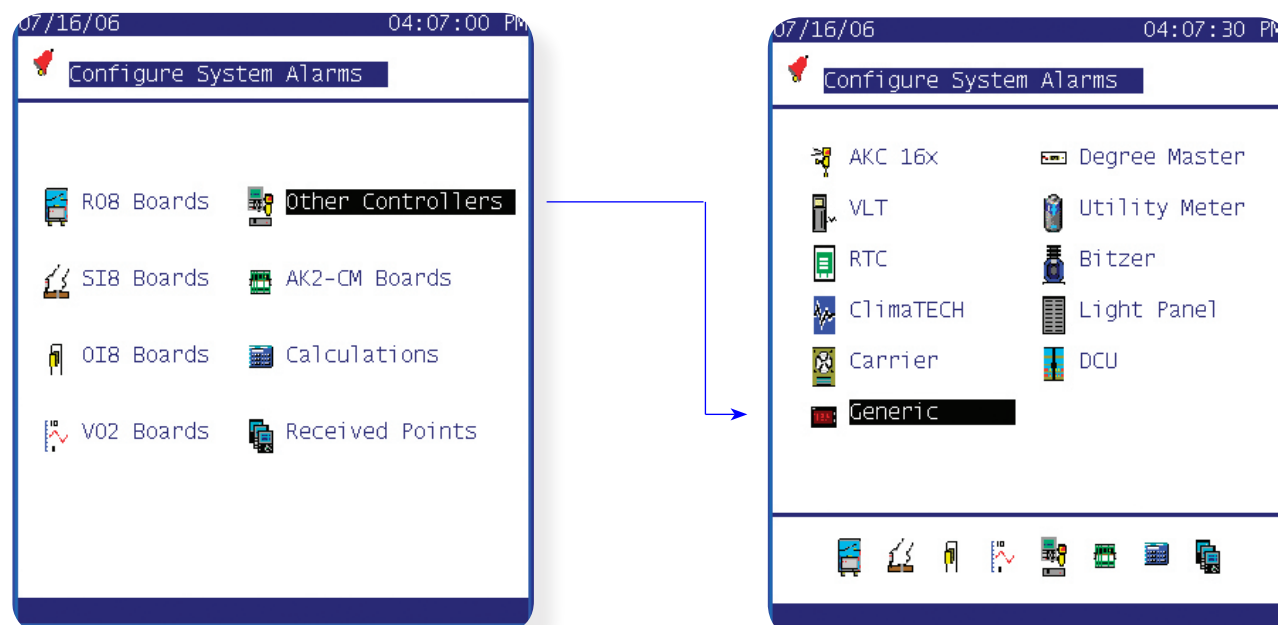
Note that when the generic devices are added to the AK2-SC255 the default alarm value for off-line alarms is 'Normal' which will generate an alarm if the device is removed from the network. The Alarm action type can be changed via a drop down box - for example if a device is being repaired or is temporally out of the system change the alarm type to disable to stop false alarms.

Remember to set back the alarm type when required as potentially no alarms will be generated.
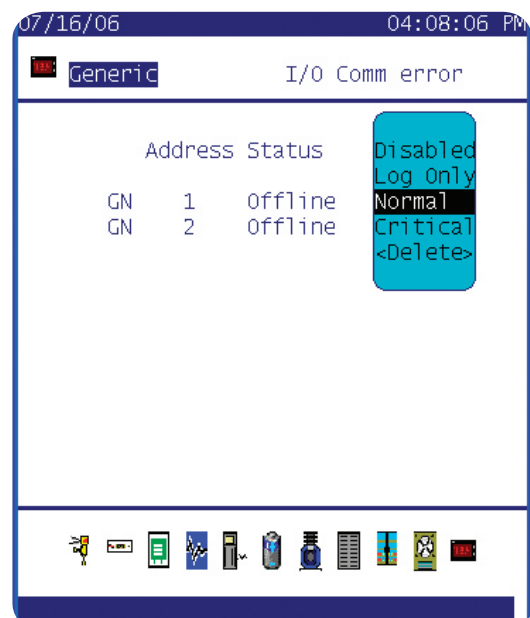
Alarm routing summary

The previous example shows how to configure the AK2-SC255 alarms for IP, e-mail, modem, printer routing. In addition the red LED and siren was also described. The Alarm Routing page is the central matrix setup that allows the user to define where alarms get sent or routed to. Ensure the class 'System' is ticked as this will allow the AK2-SC255 system and controller offline alarms to be generated. For 'Generic' controllers use the class 'Case' for both evaporator and pack controllers.
Ensure that an alarm schedule is set so that alarms can get transmitted, the factory default is 12:00 - 12:00 or 00:00 - 00:00, which is 24hrs - thus allowing alarms to get routed at any time.
For e-mail alarms ensure the DNS settings have been configured in the 'Configure Internet' page and that the e-mail address's have been filled in at the 'e-mail configuration' page.

Example of an alarm via e-mail


```
From: myaddress@danfoss.com [mailto:myaddress@danfoss.com]
Sent: Wednesday, July 19, 2006 1:43 PM
To: Andrew
Subject: EMS Alarm: Store #ABC - Comp Rack B

AK2-SC255 Address #0 Version E02.020
System Alarms
Test Alarm
AK2-SC255 Unit
Addr:  0
Alarm occurred: 07/19/06 01:42PM
Alarm if ON
Acknowledged: No
-------------------------------------------
```
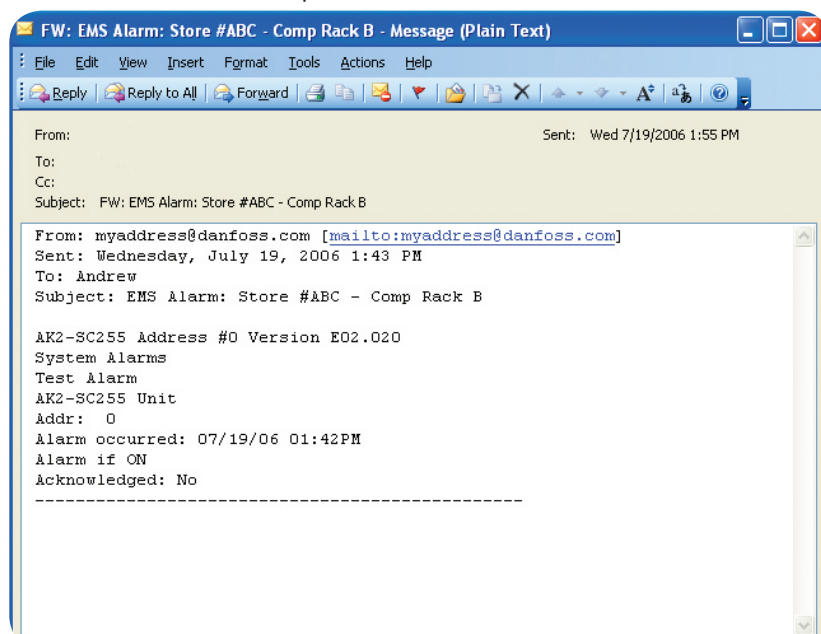
Example of 'text string' alarm

```
02/16/03              Danfoss Automatic Controls              12:37AM
A&P 27-613                                                    Rack B
AKC 55 Address #2            Alarm Log: Danfoss         Version 0.687
System Alarms
I/O Comm error                   Case                       Addr:  6
Alarm occurred: 02/16/03 12:37AM              Current Value: Trip
Alarm if error                                Acknowledged : No
---------------------------------------------------------------------
02/16/03              Danfoss Automatic Controls              12:37AM
A&P 27-613                                                    Rack B
AKC 55 Address #2            Alarm Log: Danfoss         Version 0.687
System Alarms
I/O Comm error                   Case                       Addr:  9
Alarm occurred: 02/16/03 12:37AM              Current Value: Trip
Alarm if error                                Acknowledged : No
---------------------------------------------------------------------
02/16/03              Danfoss Automatic Controls              12:37AM
A&P 27-613                                                    Rack B
AKC 55 Address #2            Alarm Log: Danfoss         Version 0.687
System Alarms
I/O Comm error                   Case                       Addr:  4
Alarm occurred: 02/16/03 12:37AM              Current Value: Trip
Alarm if error                                Acknowledged : No
---------------------------------------------------------------------
```

Appendix

Off-Line Programming / Remote access

Pre configured database file can then be
loaded into AK2-SC255
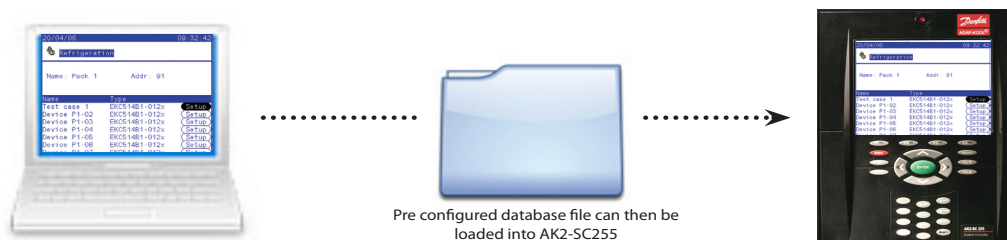
One of the major advantages of using the AKA65 remote support software tool is that the previously described steps in commissioning a site can actually be done off- line.

Utilizing the AKA65 tool allows the commissioning of a AK2-SC255 database to be completed and subsequently saved, later to be loaded down to the AK2-SC255. In effect this means that the vast majority of the commissioning process can be done without / prior to being on site.

To Commission off-line and start a new database simply start up the AKA65 remote software tool and follow the steps below;

> • Click the 'Options' button check the 'Directories' tab and ensure the AKA 65 is pointing to the correct WIN55 program
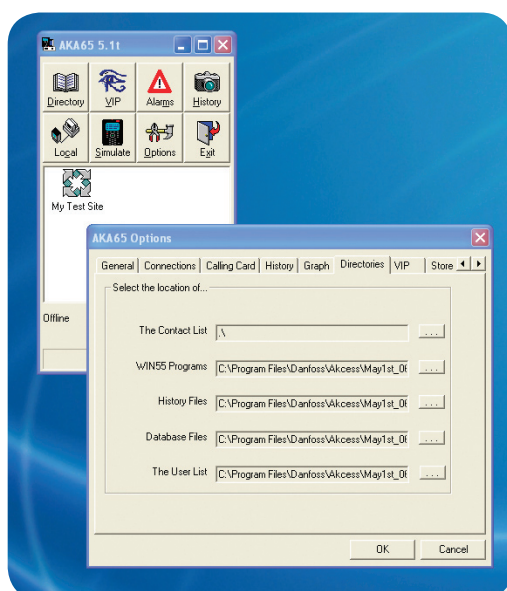
The WIN55 file is represented as a ⛵ icon and is the program that the AKA65 uses to run the AK2-SC255 environment.   Ensure that the AKA 65 directories points to the folder that holds this file. The 'E' version of the AK2-SC255 is denoted by the file name 'VExx_xxx.exe'
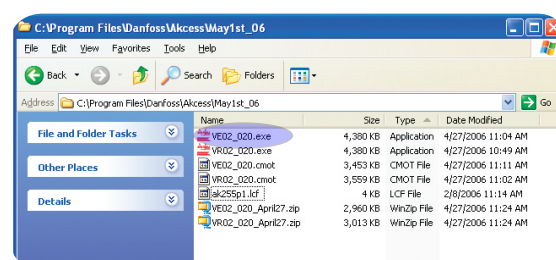
> • Close the options dialog box and click on the Simulate Icon. Select the icon 'None' in the database pane, and select VExx_xxx.exe. Select the RUN button and a new / blank AK2-SC255 database will start.
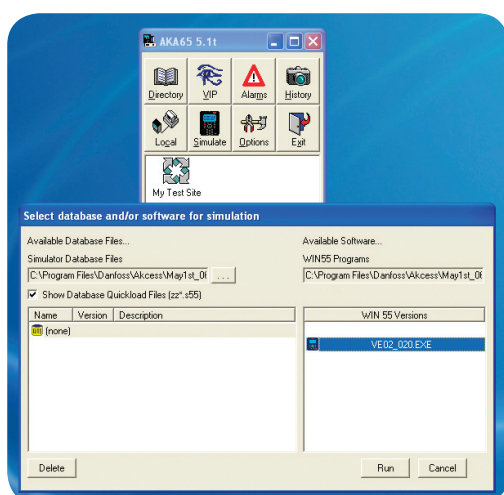
ⓘ See the Appendix section with details on how to save / load AK2-SC255 database files.

System Screen Navigation

The AK2-SC255 system has been designed to allow access to all major parameter sets in the Danfoss range of controllers. To accommodate the potential vast array of parameters the AK2-SC255 employs the use of a simple, user friendly navigation system. Once familiar with the major key actions and combinations, fast and effective navigation of the AK2-SC255 screens will follow.

The image below describes the three main 'zones' that make up key areas of the AK2-SC255 screens.

```
23/05/2006              01:03:13 PM
     1 - EKC514B1-012x

ID  Description  Value Status
1   Case 1       6.1 (s28) Ambient

Evap Summary              Measures
--- EKC State         (s28) Ambient
u17 Ther. air         6.1 °C
u18 Ther.runtime      255 min
u19 S1 temp.          -17.9 °C
u09 S5 temp.          31.6 °C
u23 AKV OD %          0 %
u10 DI1 status        OFF
u20 S2 temp.          3.8 °C
u56 Display CPT       8.0 °C
u13 Night Cond.       OFF
u21 SH                21.7 °C
--- Light             On

             F1      F2
```
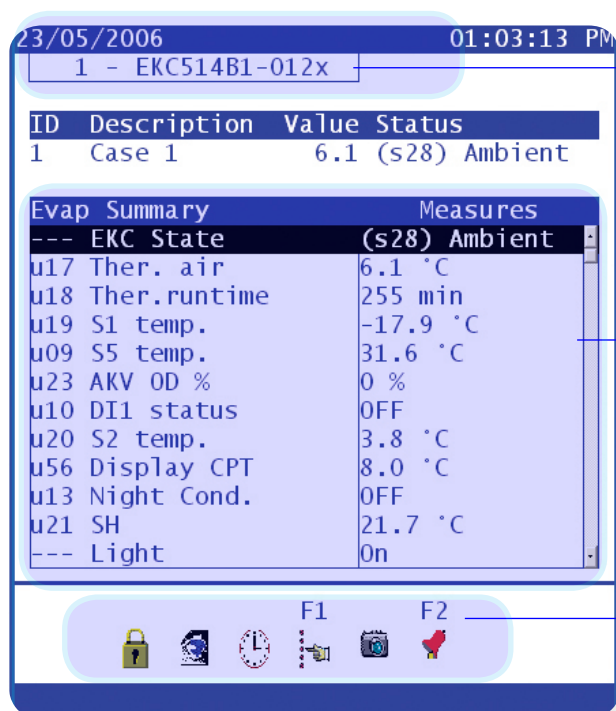
Drop down controller selection
- Used to quickly select another controller from the network.

Use the direction arrows to jump between the main screen 'zones'
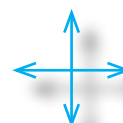
Main controller details
- Contains all the main parameter and Function groups

Short cut Icons
- Use these Icons to jump to other areas of the controller setup or system

Main keys and their function

Page Tab Icon
This indicates that there are more pages of information to display. The current progress is indicated by a yellow bar.

Function Keys
Toggle between Measurements / Settings
Daily User 'Manual override'

Escape
Use to exit current screen(s)

Prev / Next
Use to jump to the previous or next controller on the network, whilst still maintaining the current view screen
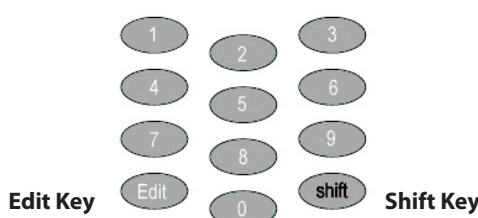
Edit Key

Used to change settings / parameters

Menu
Use directly jump to main menu

Page up / Page Down
Use scroll through main controller details page

UP , Down, Left , Right keys

Use the main arrow keys to navigate through the various screens in the AK2-SC255.

Shift Key

Used in combination with the arrow keys to activate the 'Page Tab'

How do I get the page bar to move - so I can scroll to the next function menu?

You will only see the page tab icon when you have sufficient system password privileges. To navigate through the controller functions use the following key combination(s);

Press (then release) the shift button - then press the right or left arrow key. Continue this key combination to navigate through the controller parameter function menus.
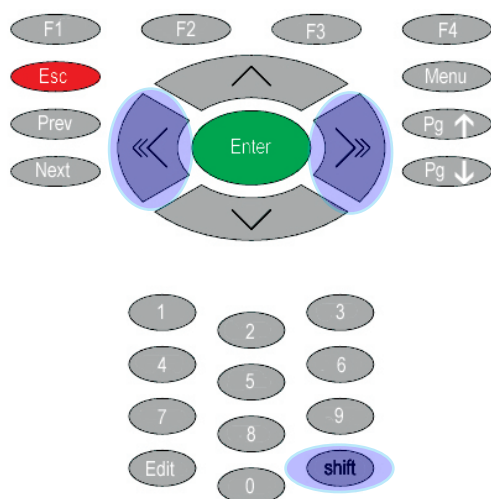

How do I change setpoints and controller parameters?

You will only be able to change setpoints when you have sufficient system password privileges. Navigate through the controller functions and locate the required parameter that needs changing - the parameter will be highlighted by the system cursor (black line). Press the Edit key once to bring focus onto the parameter, use the numerical keys to enter new value & press Enter.
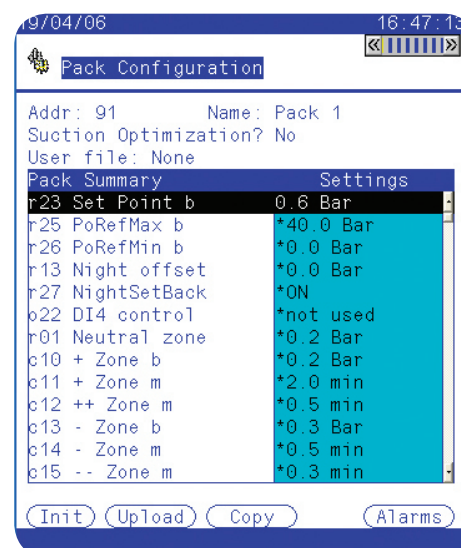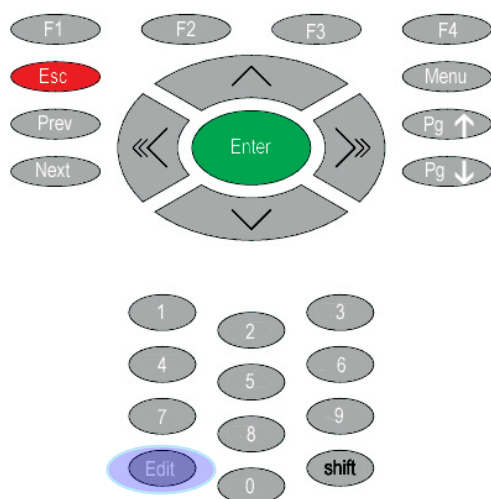
How do I update the AK2-SC255 with new software files?

It is possible to update the AK2-SC255 with new and enhanced support files. Typically the AK2-SC255 uses software files to provide a high level of controller access and visibility within the system. In order to fully and accurately support EKC and AK2 controllers, files that contain specific controller information need to be present in the AK2-SC255.

The controller support files are known as EDF files (Extended Definition Files) and these are made available from the Danfoss factory. Each controller type needs an EDF file and also important is the controller type software version. To facilitate full support ensure that the EDF file also contains compatibility for the software version of the controller - details can be found via the Danfoss factory.
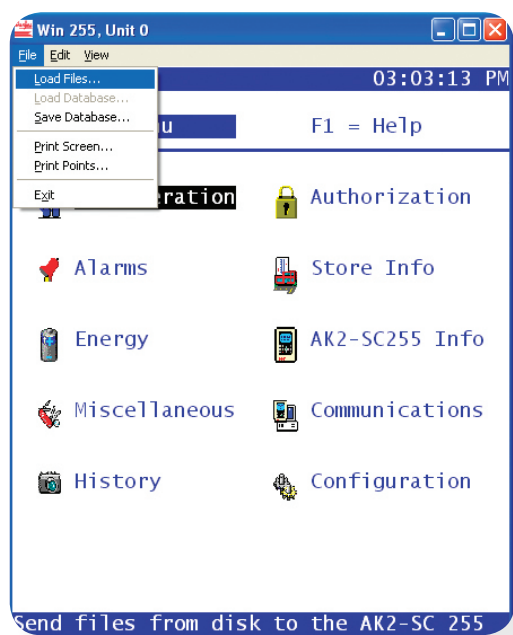
Loading EDF controller files into the AK2-SC255

Establish AKA65 connection with the AK2-SC255

Under the File Menu, select Load File...
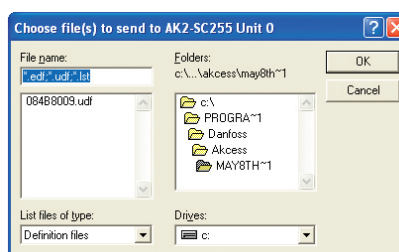
Locate required file(s) and select Ok

The files will be downloaded into the AK2-SC255

Use the above method to also update any 'device.lst' files that may be required (also available via the Danfoss factory). The 'Device.lst' file is also needed to ensure full controller support.

How do I save my online or off-line AK2-Sc255 database file?

Using the same method above, navigate to the file / Save Database... menu. Select your required file name and save. This operation fully backs up all the AK2-SC255 database and thus all system setup and commissioning values. Later this same function can be used to load a saved database into the AK2-SC255. Simply choose 'Load Database...' option to restore to the saved file.

Notes